



EN Operating instructions.pages 1 to 4
Original

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1. About this document

1.1 Function

This operating instructions manual provides all the information you need for the mounting, set-up and commissioning for the safe operation and disassembly of the safety-monitoring module. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.

1.2 Target group: authorised qualified personnel

All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

1.3 Explanation of the symbols used



Information, hint, note:

This symbol is used for identifying useful additional information.



Caution: Failure to comply with this warning notice could lead to failures or malfunctions.

Warning: Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

1.4 Appropriate use

The products described in these operating instructions are developed to execute safety-related functions as part of an entire plant or machine. It is the responsibility of the manufacturer of a machine or plant to ensure the correct functionality of the entire machine or plant.

The safety-monitoring module must be exclusively used in accordance with the versions listed below or for the applications authorised by the manufacturer. Detailed information regarding the range of applications can be found in the chapter "Product description".

1.5 General safety instructions

The user must observe the safety instructions in this operating instructions manual, the country specific installation standards as well as all prevailing safety regulations and accident prevention rules.



Further technical information can be found in the Schmersal catalogues or in the online catalogue on the Internet: www.schmersal.net.

The information contained in this operating instructions manual is provided without liability and is subject to technical modifications.



The entire concept of the control system, in which the safety component is integrated, must be validated to EN ISO 13849-2.

There are no residual risks, provided that the safety instructions as well as the instructions regarding mounting, commissioning, operation and maintenance are observed.

1.6 Warning about misuse



In case of inadequate or improper use or manipulations of the safety-monitoring module, personal hazards or damages to machinery or plant components cannot be excluded. The relevant requirements of the standard EN 1088 must be observed.

1.7 Exclusion of liability

We shall accept no liability for damages and malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. The manufacturer shall accept no liability for damages resulting from the use of unauthorised spare parts or accessories.

For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden; the manufacturer shall accept no liability for damages resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

2. Product description

2.1 Ordering code

This operating instructions manual applies to the following types:

AES 6112

AES 7112.①

No.	Option	Description
①	1	110 VAC
	2	230 VAC
	3	24 VAC



Only if the information described in this operating instructions manual are realised correctly, the safety function and therefore the compliance with the Machinery Directive is maintained.

2.2 Special versions

For special versions, which are not listed in the order code below 2.1, these specifications apply accordingly, provided that they correspond to the standard version.

2.3 Purpose

The safety-monitoring modules for integration in safety circuits are designed for fitting in control cabinets. They are used for the safe evaluation of the signals of positive break position switches for safety functions or magnetic safety sensors on sliding, hinged and removable safety guards as well as emergency stop control devices.

Design

The AES 6112 and AES 7112 have a triple redundant structure for monitoring guard doors. A first fault can lead to a failure of one of the three channels, whereby the two other channels maintain their safe function. In this system "position switches for safety functions", the requirements of EN 60947-5-3 are only met, when the combination of safety sensor and coded magnet plus safety-monitoring module is used. A safety sensor alone does not meet the requirements of this standard.

2.4 Technical data

Standards:	IEC / EN 60204-1; EN 60947-5-1; EN 60947-5-3; EN ISO 13849-1; IEC 61508; BG-GS-ET-14; BG-GS-ET-20
Start conditions:	Automatic
Feedback circuit available:	no
Start-up test:	no
Drop-out delay in case of "emergency stop":	< 50 ms
Rated operating voltage U_e :	AES 6112: 24 VDC \pm 15% AES 7112.1: 110 VAC AES 7112.2: 230 VAC AES 7112.3: 24 VAC
Rated operating current I_e :	0.2 A
Rated insulation voltage U_i :	250 V
Rated impulse withstand voltage U_{imp} :	4,8 kV
Thermal test current I_{the} :	5 A
Internal electronic fuse:	no
Power consumption:	2.5 W
Inputs monitoring:	
Cross-wire short detection:	yes
Wire breakage detection:	yes
Earth connection detection:	no
Number of NC contacts:	2x 2NC
Number of NO contacts:	2x 2NO
Outputs:	
Stop category 0:	1
Stop category 1:	0
Number of safety contacts:	1
Number of auxiliary contacts:	0
Number of signalling outputs:	0
Switching capacity of the safety contacts:	max. 250 VAC, max 5 A, ohmic, inductive only in case of appropriate interference suppression
Utilisation category to EN 60947-5-1:	AC-15: 250 V / 2 A DC-13: 24 V / 2 A
Max. fuse rating:	5 A gG D-fuse
Mechanical life:	> 50 million operations
LED display:	Release
Ambient conditions:	
Operating temperature:	0 °C ... +55 °C
Storage and transport temperature:	-25 °C ... +70 °C
Protection class:	Enclosure: IP40 Terminals: IP20 Clearance: IP54
Degree of pollution:	2
Mounting:	Snaps onto standard DIN rail to EN 60715
Connection type:	Screw connection
Min. cable section:	0.25 mm ²
Max. Cable section:	1.5 mm ² , solid strand or multi-strand lead (including conductor ferrules)
Tightening torque:	0.3 Nm
Max. cable length:	100 m of 0.75 mm ² conductor
Weight:	AES 6112: 125 g AES 7112.1: 180 g AES 7112.2: 180 g AES 7112.3: 135 g
Dimensions (H x W x D):	AES 6112: 48 x 96 x 58 mm AES 7112: 105 x 96 x 58 mm
2.5 Safety classification	
Standards:	EN ISO 13849-1; IEC 61508
PL:	up to c
Control category:	up to 1
PFFH-value:	1.14 x 10 ⁻⁶ / h; applicable for applications with up to max. 50,000 switching cycles / year and max. 80 % contact load. Diverging applications upon request.
SIL:	up to 1
Service life:	20 years

3. Mounting

3.1 General mounting instructions

Mounting: snaps onto standard DIN rails to EN 60715.

3.2 Dimensions

Device dimensions (H/W/D): AES 6112: 48 x 96 x 58 mm
AES 7112: 105 x 96 x 58 mm

4. Rear side Electrical connection

4.1 General information for electrical connection



The electrical connection may only be carried out by authorised personnel in a de-energised condition.

Wiring examples: see appendix

5. Operating principle and settings

5.1 Operating principle after the operating voltage is switched on
If the safety guard is closed or the emergency stop button released, the enabling paths of the safety-monitoring module will close. The LED is green.

Inputs S14/S22/S32

Outputs

Enabling path 13-14:NO contact for safety functions

6. Set-up and maintenance

6.1 Functional testing

The safety function of the safety-monitoring module must be tested. The following conditions must be previously checked and met:

1. Correct fitting of the safety-monitoring module
2. Fitting and integrity of the power cable

6.2 Maintenance

In the case of correct installation and adequate use, the safety-monitoring module features maintenance-free functionality. A regular visual inspection and functional test, including the following steps, is recommended:

- Check the correct fixing of the safety monitoring module
- Check the cable for damage.

Damaged or defective components must be replaced.

7. Disassembly and disposal

7.1 Disassembly

The safety monitoring module must be disassembled in the de-energised condition only.

7.2 Disposal

The safety monitoring module must be disposed of in an appropriate manner in accordance with the national prescriptions and legislations.

8. Appendix

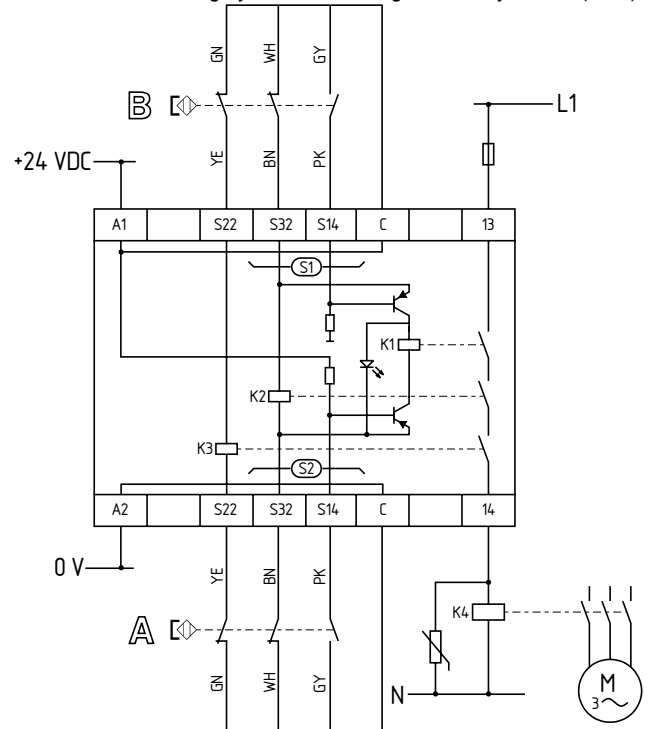
8.1 Wiring examples

The application examples shown are suggestions. They however do not release the user from carefully checking whether the switchgear and its set-up are suitable for the individual application.

The wiring diagram is shown with guard doors closed and in a de-energised condition. Inductive loads (e.g. contactors, relays, etc.) are to be provided with suitable interference suppression circuitry. Do not connect additional loads to terminal S..

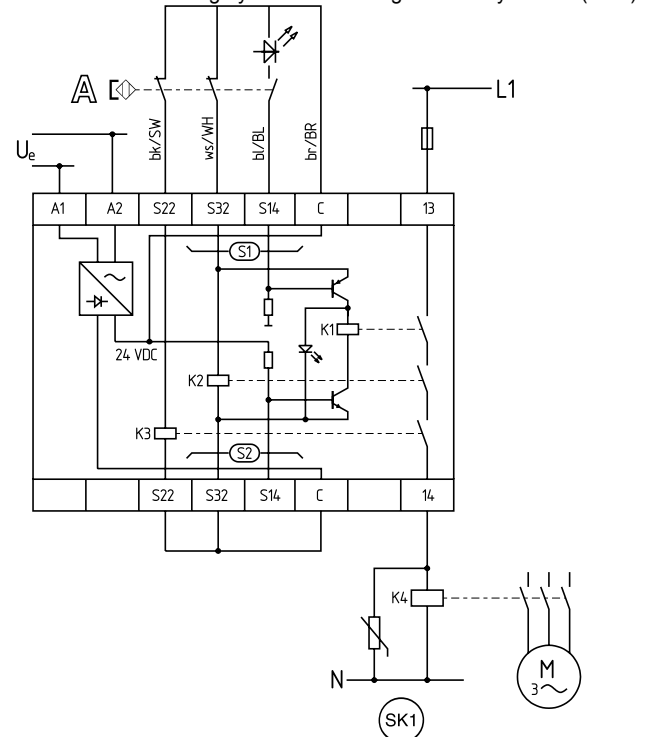
AES 6112

Guard door monitoring by means of a magnetic safety sensor (BNS)



AES 7112

Guard door monitoring by means of a magnetic safety sensor (BNS)



Key

A + B Non-contact sensor

9. EU Declaration of conformity

EU Declaration of conformity		
Original	K.A. Schmersal GmbH & Co. KG Möddinghofe 30 42279 Wuppertal Germany Internet: www.schmersal.com	
We hereby certify that the hereafter described components both in their basic design and construction conform to the applicable European Directives.		
Name of the component:	AES 7112	
Type:	See ordering code	
Description of the component:	Safety-monitoring module for non-contact safety switches and safety relay combination in connection with the BNS series magnetic safety switches	
Relevant Directives:	Machinery Directive	2006/42/EC
	EMC-Directive	2014/30/EU
	RoHS-Directive	2011/65/EU
Applied standards:	DIN EN 60947-5-3:2014, DIN EN ISO 13849-1:2016, DIN EN ISO 13849-2:2013	
Notified body for the prototype test:	DGVV Test Prüf- und Zertifizierungsstelle Elektrotechnik Gustav-Heinemann-Ufer 130 50968 Köln ID n°: 0340	
EC-prototype test certificate:	ET 16120	
Person authorised for the compilation of the technical documentation:	Oliver Wacker Möddinghofe 30 42279 Wuppertal	
Place and date of issue:	Wuppertal, June 19, 2017	
		
	Authorised signature Philip Schmersal Managing Director	

AES7112-C-EN



The currently valid declaration of conformity can be downloaded from the internet at www.schmersal.net.



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